

**Virginia Department of Health**

**Office of Drinking Water**

**Report to the Governor**

**The Efficacy of Virginia's Capacity Development Strategy**

**October 1, 2003 to September 30, 2005**

# **The Efficacy of Virginia's Capacity Development Strategy**

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### **Introduction**

This report has been prepared pursuant to Section 1420(c)(3) of the Safe Drinking Water Act (SDWA), and constitutes the second report on Virginia's Capacity Development Strategy for public water supplies. That section requires that the agency *"shall submit a report to the Governor that shall also be available to the public on the efficacy of the strategy and progress made toward improving the technical, managerial and financial capacity of water systems in the state"*. The first report was required two years after the date the state first adopted a capacity development strategy under that section, and subsequent reports are required every three years thereafter.

The capacity of a public waterworks is comprised of technical, managerial, and financial (TMF) components that reflect the water purveyor's ability to reliably produce and deliver abundant, pure drinking water to consumers. Technical capacity is seen in the physical elements of a waterworks – its water source and infrastructure – and in the knowledge and skill needed to properly operate the facility. Managerial capacity is evident in a waterworks' planning and organizational expertise. Financial capacity is evinced by the waterworks' ability to ensure sufficient revenue to meet operational, maintenance, or expansion costs.

The technical, managerial, and financial elements that constitute capacity are interdependent; all three elements are essential for ensuring the viability of a public water supply. Strength or weakness in one element of capacity can in turn either bolster or impair the other elements. For example, a waterworks that demonstrates strong financial capacity by setting adequate service rates is in turn able to make appropriate plans for future infrastructure maintenance.

The SDWA requires states to develop and implement programs that will help all new and existing public waterworks possess sufficient TMF capacity to ensure and enhance their continued operation. To fulfill this requirement, the Virginia Department of Health Office of Drinking Water (ODW) has devised a Capacity Development Strategy, which was approved by the Environmental Protection Agency (EPA) in 2000.

### **Background**

Virginia's approved Capacity Development Strategy is comprised of three main components. First, the strategy requires ODW to possess and exercise sufficient authority to prevent the creation of a new waterworks if the proposed facility cannot guarantee adequate TMF capacity to sustain its long-term viability. To meet this objective, ODW uses processes and procedures for issuing waterworks construction and operation permits as a control point. Secondly, ODW must ensure that waterworks receiving financial assistance through the Drinking Water State Revolving Fund (DWSRF) have or will achieve sufficient TMF capacity before funds are disbursed. Finally, the strategy requires ODW to have the means to assess, prioritize, and respond to the capacity limitations of existing waterworks.

When developing the Capacity Development Strategy, ODW recognized that the means for addressing capacity concerns were already significant, well-established elements of many of its routine interactions with waterworks. For example, the sanitary survey program administered by ODW involves careful evaluation of the condition of waterworks infrastructure, operational practices, and water quality indicators. All of these elements directly reflect the TMF status of the waterworks, and reveal areas of TMF strength or weakness at the facility.

The goal of improving the TMF capacities of waterworks has infused the activities conducted by ODW. Assistance to both new and existing waterworks is an ongoing, integral part of ODW's daily mission of service to Virginians.

The following sections of this report describe the efforts undertaken by ODW to implement Virginia's Capacity Development Strategy during federal fiscal years 2003 through 2005.<sup>1</sup> Program activities are discussed, with emphasis on their relevance to the assessment and enhancement of capacity development. The program activities described apply to all classifications of the 3,092 public waterworks in Virginia: community, non-transient non-community, and transient non-community. Figure 1 shows the composition of these waterworks classifications, and the populations served by each classification.

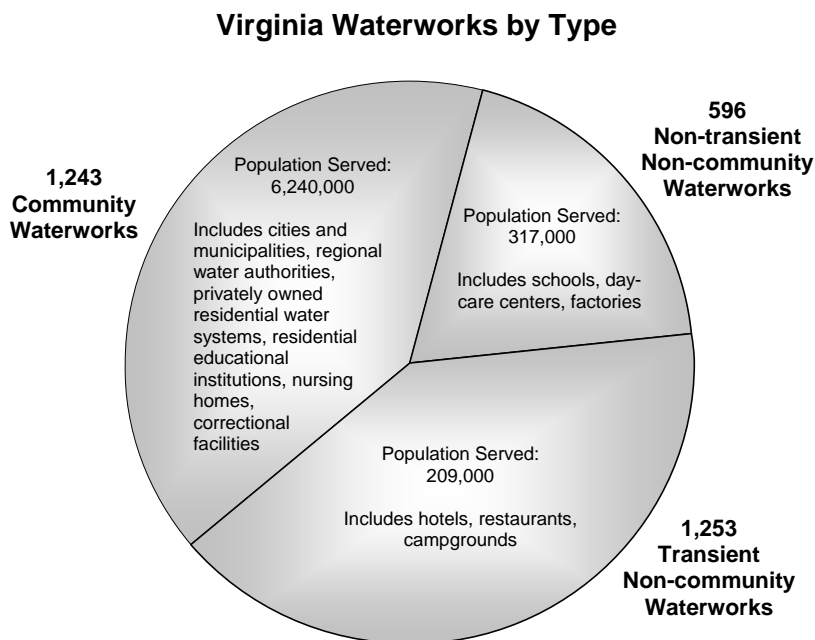


Figure 1

<sup>1</sup> Data provided throughout this report reflect only partial data from September 2005, for which information was incomplete at the time of writing.

## Sanitary Survey Program

The sanitary survey program allows ODW staff to perform onsite inspection of waterworks and affords opportunities for the assessment of waterworks for TMF capacity. During the course of a sanitary survey, ODW personnel conduct thorough evaluations of waterworks infrastructure and water treatment processes. Water quality monitoring records are reviewed, and operational practices and controls are examined. Waterworks staff qualifications are assessed. In 2005 a new evaluation tool was added to sanitary surveys, in which community water supply owners and operators are asked to perform an infrastructure self-assessment, projecting their anticipated expenses for infrastructure improvement, repair or replacement.

Through the sanitary survey process, waterworks' capacity needs are identified, prioritized, and targeted for guidance and assistance from ODW staff. The culmination of the sanitary survey is a written report which serves as a roadmap for waterworks owners to follow for correcting waterworks deficiencies or improving waterworks operation.

In addition to routine sanitary surveys, ODW personnel conduct special sanitary surveys of waterworks, consisting of site visits to evaluate new construction, investigate consumer complaints, and respond to specific requests for assistance. Site visits are also made to perform Source Water Assessments, and to evaluate the locations of proposed new wells. The hallmark of these site visits is the opportunity afforded for direct, face-to-face interaction with waterworks owners and operators, allowing the provision of immediate guidance on interventions to improve TMF capacity.

During the reporting period, ODW staff performed 5,719 routine sanitary surveys, 1,221 special sanitary surveys (including inspection of new construction, complaint investigations requiring field visits, and delivery of onsite assistance), and 1,664 site visits to assess water sources. Field activities performed by ODW staff are summarized in Figure 2.

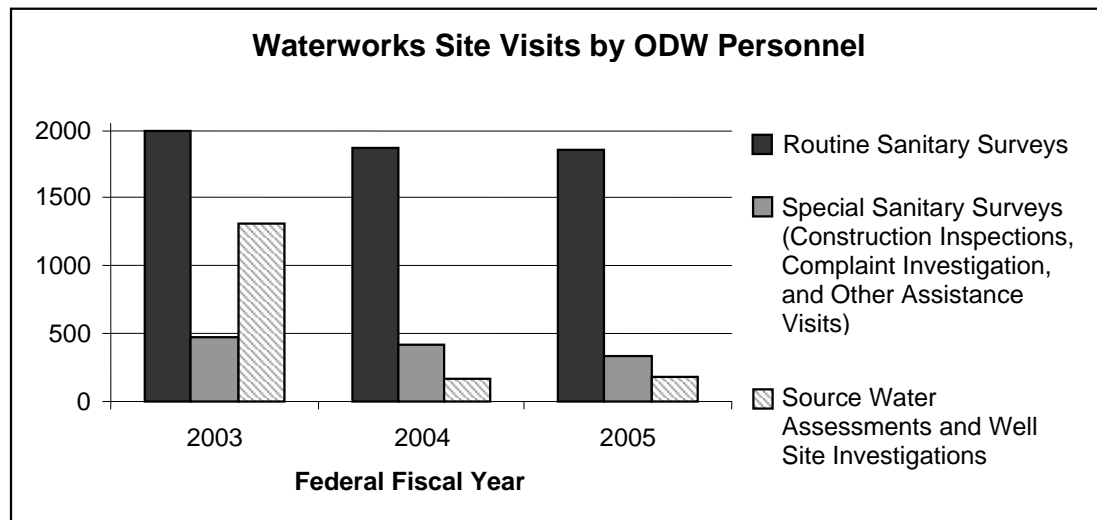


Figure 2

## **Assistance Contacts Reported by Field Staff**

In addition to site visits, ODW staff interacts with waterworks owners and operators and provides assistance through a variety of informal contacts including meetings, telephone calls, and emails. Assistance is given that covers a full range of TMF concerns. For instance, help may be given to address water quality sampling needs, or to follow up on corrective measures described in a sanitary survey report. Waterworks operators may be apprised of upcoming training opportunities or offered help with water treatment dosage calculations. Owners may be advised of impacts or requirements of pending regulations for consumer education. During the reporting period, ODW staff received and responded to 32,053 assistance requests from the owners and operators of Virginia's public water supplies.

## **Source Water Assessment and Source Water Protection**

As of April 2003, ODW completed a focused effort to perform Source Water Assessment Reviews on all public water supplies that were active at that time. These assessments were designed to reveal the potential vulnerabilities to manmade contamination that water supplies might face. The assessments serve as a tool for water supply resource planning, and specifically support waterworks managerial capabilities. ODW continues to perform assessments on new waterworks and to update historical assessments as a result of ongoing field observations made during sanitary surveys.

During the reporting period, ODW created a Wellhead Protection Plan Development Program for small community groundwater waterworks in central and western Virginia. The program delivers technical support from a contract provider to small water systems serving less than 3,300 persons. The resulting plans enable the participating waterworks to take steps to safeguard their drinking water sources, by managing and controlling activities in the vicinity of the source that could compromise water quality and quantity. To date, participation in this program has enabled twenty small water systems to prepare and implement site-specific Wellhead Protection Plans. Additional plans are currently in development.

## **Construction Plans and Permit Review**

ODW approved 1,444 permit applications and 1,568 plans and specifications for new construction or system improvements during the reporting period. The approval of permit applications is especially noteworthy in regard to capacity development. ODW uses authority via the *Code of Virginia* §§32.1-169 and 32.1-172B, and §12VAC5-590-190 of the *Virginia Waterworks Regulations* to prohibit the establishment, construction, or operation of a water supply without a written permit, and requires the submission of TMF information in the application for a permit. Permitting authority for construction and operation is used as a control point to prevent the creation of waterworks lacking sufficient TMF capacity to sustain operations. Permits are issued only to waterworks able to demonstrate the potential for long-term TMF viability.

There is a five-step application process that each potential waterworks must complete satisfactorily before a permit to construct will be issued. The application process includes:

- notification of intent;
- preliminary engineering conference;
- submission of a Preliminary Engineering Report (PER);
- submission of a Waterworks Business Operation Plan (also known as a Comprehensive Business Plan), which includes background information on the qualifications of persons involved with the system; operations and maintenance information; technical data to supplement the PER; financial data projecting expenses and revenues and identifying sources of funds and financial controls; and
- submission of final plans and specifications.

After construction, the waterworks owner must submit a statement by a licensed professional engineer that the construction work was completed in accordance with the approved plans and specifications, based on inspections of the waterworks during and after the construction. Upon receipt of the statement, ODW issues a permit to operate. The permit also establishes the classification of the waterworks for the purpose of setting licensure requirements for personnel.

These procedures ensure that a new waterworks starts with infrastructure that is designed and constructed to provide an adequate supply of pure water, and that the facility will be adequately staffed by skilled, appropriately licensed staff. These measures also compel prospective owners to plan for long term financial viability.

### **Assistance Related to Comprehensive Business Plan Contract**

Prior to issuing operations permits, ODW uses the review of Waterworks Business Operation Plans as a screening tool for proposed new waterworks, and for existing waterworks under new ownership. Business plans are also required of potential recipients of DWSRF financial assistance, and they are often used as a corrective measure during enforcement proceedings.

In the process of preparing Waterworks Business Operation Plans, water supplies gain a valuable resource for strengthening their managerial and financial capacities. The planning process gives waterworks tools for establishing effective budgets, appropriate service rates, and financial reserves to sustain long-term viability. Plans must include an inventory of infrastructure assets, anticipated operational and maintenance expenses, monitoring costs, and revenue sources.

ODW has established a contractual relationship with the Southeast Rural Community Assistance Project (SERCAP) to help waterworks with the preparation of Waterworks Business Operation Plans. Under the contract, SERCAP provided direct assistance to 57 waterworks during the reporting period.

ODW and SERCAP have also worked together to develop a suite of business plan worksheets, along with guidelines for ODW staff to follow when evaluating the plans submitted by waterworks. Staff training on the use of these assessment tools is being planned for the later part of 2005.

## **Contaminant Vulnerability Assessments for Issuing Monitoring Waivers for Some Classes of Contaminants**

ODW staff reviewed and assessed 1,998 applications for monitoring waivers from eligible waterworks during the reporting period. For some groups of man-made chemical contaminants, waterworks may forgo routine water quality monitoring if they can demonstrate that the source is located and constructed in a way that eliminates susceptibility to the contaminants, and that the source is not vulnerable to contamination because the chemicals are not in use in the vicinity of the source. The waiver application process involves a self-assessment of the source's susceptibility and vulnerability by waterworks owners; application review affords ODW an opportunity to screen waterworks for conditions that may impair water quality. The waiver process encourages TMF capacity by highlighting beneficial planning efforts that the owner can take to protect water sources.

## **Compliance and Enforcement Program**

ODW routinely reviews water quality data submitted by public water supplies, and issues Notices of Violation (NOVs) for water that does not meet the standards contained in the *Virginia Waterworks Regulations*. NOVs are also issued for monitoring infractions, improperly licensed staff, recordkeeping and reporting failures, or for other conditions that deviate from standards established by the SDWA and the *Virginia Waterworks Regulations*. During the reporting period, ODW sent 5,548 NOVs to noncompliant waterworks.<sup>2</sup>

In cases of chronic or egregious noncompliance, ODW holds enforcement hearings and issues administrative orders to compel corrective measures that will lead to compliance. As required by state law, hearings are conducted to give parties their due process rights under the law before issuing adverse decisions. ODW has authority to issue binding consent orders and unilateral special orders to waterworks owners who have violated the regulations; both orders set timelines for bringing the waterworks into compliance.

ODW focuses these enforcement efforts on waterworks deemed to be significantly noncompliant (SNC), based on compliance criteria employed by EPA. Quarterly SNC reports are used to prioritize staff allocation of assistance to waterworks with numerous or

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<sup>2</sup> Approximately 62% of the NOVs issued during the reporting period were for monitoring violations, that is, violations incurred because of waterworks failure to collect, analyze, and report required water quality samples. The number of NOVs is likely inflated as a result of two unique factors that occurred during the reporting period. First, most of Virginia's waterworks use the Division of Consolidated Laboratory Services (DCLS) for water quality analyses; DCLS began charging fees for water quality analyses in 2002. Many waterworks failed to collect required samples after fees were initiated because they were not accustomed to handling invoices or paying for services. Additionally, when DCLS laboratory fees were introduced waterworks owners became fully responsible for obtaining all of their sampling kits directly from the lab instead of from ODW field offices. ODW was forced to end the longstanding practice of collecting samples on behalf of waterworks owners and forwarding samples to DCLS for processing. Numerous monitoring violations were incurred by waterworks when these changes occurred. Secondly, the transfer of oversight for transient non-community waterworks to ODW from local health departments led to increased surveillance, greater accountability, and more conscientious reporting of noncompliance for this class of waterworks. These factors produced significant TMF challenges to waterworks during the reporting period, and were addressed by a proportionate increase in assistance contacts by ODW staff. The total number of NOVs issued is expected to be lower in future years, as waterworks owners and operators continue to adapt to these new conditions.

especially serious compliance failures. ODW held 33 hearings and issued 38 administrative orders during the reporting period.

ODW employs an enforcement approach that is highly focused on identifying solutions to the underlying causes of water supplies' noncompliance with state and federal drinking water regulations. Various enforcement tools are used to direct attention and provide guidance to waterworks owners on ways to correct deficits in their TMF capabilities. For instance, during the course of an administrative enforcement hearing it may be determined that inadequate waterworks revenues are the ultimate cause of chronic monitoring failures. The waterworks may be asked to submit a Waterworks Business Operations Plan as a budgeting tool, or given assistance with rate setting to address the underlying lack of financial capacity.

ODW is developing a new enforcement tool in the form of a receivership protocol, which can be used to address compliance concerns at intractable, noncompliant waterworks. The protocol clarifies procedures ODW must follow when petitioning courts to appoint qualified waterworks operators or managers as receivers. The protocol will allow ODW to contract with a competent receiver, using DWSRF set-aside monies. Placing a waterworks into receivership will protect public health by allowing proper operation and stabilization of the facility until a long term solution can be reached.

Noncompliance with the regulations has been traditionally viewed as a useful reflection of waterworks capacity, and thus of the capacity program's effectiveness. Tracking and addressing compliance failures by waterworks is recognized as an important aspect of assessing and developing capacity. Conversely, compliance with the regulations is also a useful indication of waterworks capacity. A key challenge for the future is to develop measurement tools for assessing the positive impact of compliance on the health and well-being of Virginians.

### **Data Collection and Analysis**

ODW maintains and utilizes the Safe Drinking Water Information System (SDWIS), which is an extensive electronic inventory of waterworks facilities, personnel, sampling data, and compliance status. SDWIS is the primary vehicle by which ODW reports required information to EPA. SDWIS is also the principal repository of data that OWD uses to manage contacts with waterworks, inspection schedules, and compliance sampling data, through an interface called SDWIS Data Reports and Retrieval (know colloquially as R&R). Adjunct electronic tracking tools are used to track application and plan review activities. Use of these electronic tools facilitates interaction with waterworks and provides the means to quickly assess many elements related to waterworks TMF capabilities. ODW devoted an average of approximately 4.7 FTEs to database maintenance during each year of the reporting period.

In July 2001, ODW developed another adjunct electronic tool to complete a baseline assessment of all community and non-transient non-community waterworks. These facilities, which serve an estimated population of 6.5 million persons, were evaluated and scored based on their compliance status, infrastructure condition, managerial and financial indicators, and their preparedness to respond to impending regulatory impacts. The baseline assessment data were used to make referrals to assistance providers under contract with ODW. For instance,



waterworks with low compliance and infrastructure condition scores were offered engineering planning and design assistance. Waterworks scores were also used to set priorities for assistance contacts with waterworks by ODW staff. During the latter half of calendar year 2005, ODW will reevaluate the waterworks and update database records. The reassessment data will be compared to the original baseline assessment to identify areas of continued need.

### **Waterworks Advisory Committee**

The SDWA requires states to identify persons with interest or involvement in the creation and execution of their capacity development programs. To meet this requirement, ODW has partnered with Virginia's Waterworks Advisory Committee, which is comprised of a diverse group of waterworks stakeholders throughout the state. The committee is given opportunities to provide input into the ongoing development of ODW policies and procedures, and is consulted frequently regarding the implementation of specific programs, including those relating to capacity development. The Waterworks Advisory Committee and ODW staff met 12 times during the reporting period.

### **Operator Licensure**

Over 1,800 of Virginia's public waterworks are required to be staffed by licensed operators. Depending on their size or complexity, some facilities may require multiple shifts or 24-hour staffing by one or more licensed operators. As of June 2005, there were a total of 2,479 licensed waterworks operators in Virginia – a professional pool that has increased approximately 24% over the past four years. To qualify for licensure operators must meet requirements for on the job and classroom training, and they must pass a licensure exam.

ODW facilitates the development of operators' TMF competencies by offering and sponsoring ongoing operator training. During the reporting period, ODW partnered with Virginia Tech to offer comprehensive training at annual Water Operator Short Schools, which were attended by 266 people. Other training events were provided, including Continuing Professional Education workshops, Video Conferences for Class VI operators, and Class VI Operator's Short Courses. In addition, ODW offered 12 courses in Cross Connection Control. The curricula for these programs include technical topics such as equipment operation and maintenance, drinking water chemistry and microbiology, water treatment technologies, and operator math. Managerial aspects of waterworks operation are addressed through course offerings on the Virginia *Waterworks Regulations*, waterworks administration, source water protection, and waterworks security. A new training series on waterworks revenues, service rates, and grants is currently in development to specifically address the financial capacity needs of public waterworks.

### **Transfer of Transient Non-community Waterworks Oversight to ODW**

Beginning in 2002, the oversight of Virginia's transient non-community waterworks was transferred from the local health departments to ODW, in response to the recommendation of EPA. ODW is now supplying oversight to 1,253 active transient non-community waterworks. This class of waterworks is comprised of businesses such as restaurants, hotels, and campgrounds that operate independent water supplies. For these businesses, the availability

of a reliable source or drinking water is essential to business operations, but water production is often an ancillary, low-priority activity. Consequently, compliance with the Virginia *Waterworks Regulations* often receives scant concern or attention by waterworks owners. ODW is providing consistency in implementing the regulations at these waterworks, but key challenges exist, especially from the standpoint of addressing the issue of owners' TMF competencies.

### **Drinking Water State Revolving Fund**

The Drinking Water State Revolving Fund (DWSRF) administered by ODW provides financial aid in the form of loans and grants to water systems in need of infrastructure improvement, maintenance, and development. All waterworks that qualify to receive DWSRF monies are assessed by ODW staff to determine if the waterworks has sufficient TMF capacity before loans are disbursed. Waterworks that do not appear to have sufficient capacity are prioritized to receive assistance, such as that offered by SERCAP in preparing a Waterworks Business Operation Plan. During the reporting period, the DWSRF closed on low-interest or interest-free loans totaling \$42,196,614 to 52 waterworks; planning grants in the amount of \$802,050 were awarded to 37 waterworks.

### **Conclusion**

The Capacity Development Strategy is proving to be an effective tool to improve the technical, managerial, and financial (TMF) components of Virginia's public water suppliers' ability to reliably produce and deliver abundant, pure drinking water to consumers. The incorporation of the Strategy into the Office of Drinking Water's (ODW) major program activities and the daily work of staff maximize the potential for successful capacity development. The Strategy also indirectly protects the security of Virginia's water supply infrastructure. As public water supplies improve their TMF capacities, they become better prepared to react and respond to natural disasters, and to safeguard their facilities from man-made threats.

However, the opportunity that the Capacity Development Strategy presents to ODW to strengthen Virginia's public water supplies is potentially hampered by budgetary constraints and staffing limitations. Without adequate funding and proper staffing, program efficacy could be impaired.

Although the Drinking Water State Revolving Fund (DWSRF) has closed on loans of nearly \$130 million to date, and though the available grant and loan funds have been closely matched to "ready-to-proceed" project needs, there are continuing needs faced by Virginia's public water supplies. Since the needs most appropriately addressed by the DWSRF occur in the most financially challenged localities, the unmet need for grants considerably exceeds the supply. An additional challenge has been created by the Federal allotment strategy to states which is based on a National Needs Survey done every four years. Although the National Needs Survey conducted in 2003 indicated that Virginia's drinking water infrastructure needs had risen since the 1999 survey, the state's needs did not rise at the same pace as the total national need. Thus, the DWSRF grant allotment to Virginia for federal fiscal years 2006 through 2009 was reduced by \$2.65 million.

Many localities and waterworks are unable to fully take advantage of drinking water construction funding due to a lack of funds necessary to complete planning efforts. Without adequate grant funds to perform proper project planning, many projects are either never undertaken or are significantly delayed.

An increase in the complexity and number of federal drinking water regulations that must be implemented, monitored, and enforced has resulted in an increased workload. Additional environmental inspectors are needed to provide technical assistance and perform routine inspections to evaluate the capability of waterworks to deliver an adequate quality and quantity of safe drinking water and to comply with state and federal drinking water standards

Within these limitations, ODW will continue to implement the Capacity Development Strategy. Funds and staffing will be devoted to those activities most critical to enabling waterworks to have sufficient TMF capacity for provision of safe drinking water.